

U.S. National Science Foundation Directorate for Technology, Innovation and Partnerships

## Accelerating Technology, Innovation and Partnerships

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EPSCoR Webinar February 12, 2024





## NSF Supports All Areas of Science and Engineering



Integrative Activities

International Science & Engineering



## A Pivotal Moment for the Nation and Society





Climate change Equitable access to education, health care

Critical and resilient infrastructure





## A Changing Science and Engineering Enterprise Can Meet This Moment



Pace of discovery accelerated by data, emerging technologies Demand for societal and economic impact Opportunity to leverage partnerships



## A New "Horizontal": Strengthen, Scale Use-Inspired and Translational Research



#### DIRECTORATE FOR TECHNOLOGY, INNOVATION AND PARTNERSHIPS

MATHEMATICAL & PHYSICAL SCIENCES



Integrative Activities

International Science & Engineering





U.S. National Science Foundation Directorate for Technology, Innovation and Partnerships

## **TIP Directorate Mission**

TIP harnesses the nation's vast and diverse talent pool to advance critical and emerging technologies, address pressing societal and economic challenges, and accelerate the translation of research results from lab to market and society. TIP improves U.S. competitiveness, growing the U.S. economy and training a diverse workforce for future, high-wage jobs.



## Catalyzing a Paradigm **Expansion**

Today	Tomorrow
<ul> <li>Largely investigator-driven</li> </ul>	<ul> <li>Users / beneficiaries engaged in shaping, conducting research</li> </ul>
Primarily academic research teams	<ul> <li>Multi-sector teams – academia, industry, government, civil society, communities of practice</li> </ul>
<ul> <li>Stream of discoveries improve prosperity, resilience, quality of life</li> </ul>	<ul> <li>Important societal and/or economic problems drive research pursuits</li> </ul>
"Technology / supply push"	- "Market / demand pull"





## TIP's Core Message

TIP advances U.S. competitiveness and societal impact by nurturing partnerships that drive and accelerate:



Diverse Innovation Ecosystems



Technology Translation and Development



### Workforce Development



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#### NSF Convergence Accelerator funds

transdisciplinary teams through convergence research and innovation processes to stimulate innovative idea sharing and development of sustainable solutions to solve societal challenges.

Two Phases:

#### PHASE I (PLANNING)

9 months Up to **\$750,000** 

#### PHASE II (IMPLEMENTATION)

24 months Up to **\$5 Million** 





## **NSF Convergence Accelerator Portfolio**





#### **NSF Regional Innovation Engines (NSF Engines)**

program supports the development of diverse, regional coalitions to engage in use-inspired research, drive research results to the market and society, promote workforce development, and ultimately stimulate the economy and create new jobs.

NSF Engines are funded up to **\$160 million** for up to **10** years

NSF Engine Development Awards funded at up to **\$1 million** for up to **2** years to plan for an Engine





## **NSF is Making History**

NSF Engines awards represent:

- \$1.6 billion over a decade
- 450+ partners across sectors
- 18 states across 10 regions; 69 regions total across the U.S.
- 2:1 matched investment from public and private sectors
- Catalyzing America's innovation economy in all corners of the country





## **The 10 Inaugural NSF Engines**





## **CHIPS and Science Act: Key Technology Focus Areas**

### NSF ENGINES KEY TECHNOLOGY AWARDS AREA BREAKDOWN





## **NSF Engines Partnerships Network**





## **Central Florida Semiconductor Innovation Engine**

#### Lead Organization:

ICAMR, Inc. (dba BRIDG)

#### **Primary Societal Challenge:**

Making the U.S. a leader in semiconductor advanced packaging design and manufacturing

#### **Innovations:**

Advanced semiconductor packaging, digital twin advanced packaging design and manufacturing, county-owned fabrication facility

#### **Capital Commitments:**

\$50 million from Florida Commerce and the Florida Department of Education; \$50 million from EDA Build Back Better Regional Challenge; \$49 million recently from U.S. Department of Defense

#### Key Fact:

The 5,000 square foot campus is a unique model where the county owns the land and there is a high school on the campus

#### Sampling of Partners (10)

ACADEMICS (3) GOVERNMENT ENTITIES (1) INDUSTRY (1) NON-PROFIT (5) UNIVERSITY OF CENTRAL FLORIDA OSCEOLA COUNTY SKYWATER TECHNOLOGY ORLANDO ECONOMIC PARTNERSHIP



## ND Advanced Agriculture Technology Engine

#### Lead Organization:

North Dakota State University

#### **Primary Societal Challenge:**

Driving the agtech revolution by partnering with rural and tribal communities to spur inclusive economic development

#### **Innovations:**

Crop genomics, climate modeling, advanced crop data, sensors

#### **Capital Commitments:**

EDA Good Jobs Challenge Awardee, UAS FAA drone site

#### **Key Fact:**

#1 U.S. producer of peas, beans, barley, canola, flax, oats, and wheat

#### Sampling of Partners (65)

ACADEMICS (14) GOVERNEMNT ENTITIES (8) INDUSTRY (32) NON-PROFIT (11) Tribal Entities (5) UNIVERSITY OF MONTANA NORTH DAKOTA GOVERNOR'S OFFICE BANKNORTH, MICROSOFT (FARGO) NORTH DAKOTA FARMERS UNION NUETA HIDATSA SAHNISH COLLEGE



## **Louisiana Energy Transition Engine**

#### Lead Organization:

Louisiana State University

#### **Primary Societal Challenge:**

Advancing US's capacity for innovation in low-carbon energy with a focus on carbon capture and hydrogen

#### **Innovations:**

Carbon capture, hydrogen fuel, CO2 as feedstock, sustainable manufacturing for clean energy

#### **Capital Commitments:**

\$67.5 million from state, EDA BBRC winner +Tech Hubs finalist

#### **Key Fact:**

There are over 5,000 miles of oil, gas, chemical, H2 and CO2 pipelines in Louisiana



#### Sampling of Partners (49)

ACADEMICS (13) GOVERNEMNT ENTITIES (5) INDUSTRY (21) NON-PROFIT (10) DILLARD UNIVERSITY LOUISIANA ECONOMIC DEVELOPMENT EXXONMOBIL, SHELL SOUTH LOUISIANA ECONOMIC COUNCIL



## **NSF Engines Builder Platform**

- Run by The Engine Accelerator, a public benefit corporation with origins at MIT.
- A unique post-award support model that will provide tailored resources and a high level of personalized engagement and support that will significantly contribute to the success of the NSF Engines program.
- The NSF Engines Builder Platform is a human-centered portfolio of support structures that empowers awardees with the tools, networks and capital needed to thrive.
- The Platform is inspired and informed by the support systems pioneered by venture incubators and accelerators, national philanthropy and lessons learned from prior place-based investment efforts.





#### Enhancing Partnerships to Increase Innovation Capacity (EPIIC) program

provides training and networking support to help build more inclusive innovation ecosystems and pathways into NSF Regional Innovation Engines.

Awarded a total **\$19.6 million** to nearly 50 teams.

New funding opportunity is available. Deadline to apply is **January 21, 2025**.



#### **Opportunity available to:**



Academia





#### **DIVERSE INNOVATION ECOSYSTEMS**



NSF Enabling Partnerships to Increase Innovation Capacity







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## Workforce Development





Innovation Corps (I-Corps<sup>™</sup>) provides experiential entrepreneurial education to further the nation's innovation ecosystem. Hubs implement the I-Corps program by creating a network of universities that help researchers learn how to test the market through customer discovery.

#### I-Corps Hubs Funding for up to \$3 million per year for 5 years; Proposals due April 25, 2024

**10 I-Corps Hubs** involving nearly 100 universities

I-Corps Teams Funding for \$50,000 for 7 weeks





**Opportunity available to:** 



Academia





#### America's Seed Fund powered by NSF (the Small

Business Innovation Research and Small Business Technology Transfer program) provides up to **\$2 million** in research and development funding for deep-tech startups, transforming scientific and engineering discoveries into products and services with commercial and societal impact. CHIPS and Science Act 2 0 2 2



Submit a Project Pitch to get started!







Academia



**Business & Industry** 

#### **Pathways to Enable Open-Source Ecosystems**

(POSE) supports sustainable high-impact opensource ecosystems to ensure more secure opensource products, increase coordination of developer contributions and a more focused route to impactful technologies.

Two Phases:

#### PHASE I

1 year Up to **\$300,000** 

# PHASE II 2 years Up to \$1.5 million







#### Accelerating Research Translation (ART) program

supports institutions of higher education to build capacity and infrastructure to strengthen and scale the translation of basic research outcomes into impactful solutions.

Awarded more than \$100 million to **18 teams** at academic institutions across the nation.



**Opportunity available to:** 



Academia



#### **TECHNOLOGY TRANSLATION AND DEVELOPMENT**



#### NSF ART Awards:

The NSF Accelerating Research Translation (ART) awards support institutions of higher education (IHEs) that seek to build capacity and infrastructure for translation of fundamental academic research into tangible solutions that benefit the public.

For more information, please visit the NSF ART program website. 🚺







#### Project Roles by Institution

(Each ART award includes a Lead Institution and Mentor Institution. Some awards also include a Partner Institution.)



Lead Institution in EPSCOR Jurisdiction (Awards) (EPSCoR: Established Program to Stimulate Competitive Research)



Awards with Woman PIs (Lead Institutions) (PI: Principal Investigator)



#### Map Legend



EPSCoR State with Lead, Mentor, or Partner Institution involved in ART award



#### **TECHNOLOGY TRANSLATION AND DEVELOPMENT**

## The Responsible Design, Development and Deployment of Technologies (ReDDDoT)

program is a collaboration with five philanthropic partners and crosses all disciplines of science and engineering. The program seeks to ensure ethical, legal, community and societal considerations are embedded in the lifecycle of technology's creation and use.

#### **\$16 million** program







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REDDDDOT Responsible Design, Development, & Deployment of Technologies

For more information visit: https://new.nsf.gov/funding/opportun ities/responsible-design-developmentdeployment



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## Workforce Development



### **Experiential Learning for Emerging and Novel Technologies (ExLENT)** program promotes partnerships between organizations in emerging technology fields and those with expertise in workforce development to expand practical learning opportunities for individuals interested in entering or gaining more experience in emerging and novel technology.

NSF awarded **\$18.8 million** to **27 projects** over 3 years. Proposals due **September 2024.** 







#### **WORKFORCE DEVELOPMENT**



NSF Experiential Learning for Emerging and Novel Technologies

Click the icons on the map to see additional details.

Learn more about NSF Experiential Learning for Emerging and Novel Technologies program by visiting the website.





Through a \$20 million cooperative agreement, the **Entrepreneurial Fellowships** run by the non-profit, Activate.org, support researchers from a variety of backgrounds and geographies to move technologies from lab to market.

2 years of training

At least **\$350,000** in direct support, plus specialized research facilities and equipment



**Opportunity available to:** 



Individual Researchers



NSF funded the **Council of Graduate Schools** to expand data collection activities and help recruit graduate students in key technology areas. By collecting more data, universities will use data-driven decision making to address challenges in recruiting and retaining domestic graduate students underrepresented in STEM.

A combined nearly **\$5.8 million** over **4** years.



For more information: https://new.nsf.gov/tip/upda tes/nsf-supports-councilgraduate-schools-efforts



## TIP: Accelerating Research To Impact





## RAMPING UP TIP



U.S. National Science Foundation Directorate for Technology, Innovation and Partnerships

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MARCH

	March 16: TIP established	Sept. 8: NSF awards five new L-Corps™ Hubs Sept. 19: NSF launches Entrepreneurial Fellows program	Nov. 10: NSF announces winners in first phase of NSF, NIST, OSTP, UK privacy prizes	<section-header><image/><image/><text></text></section-header>	Feb 8: NSF launches ART program
MARCH 22	July 20: NSF, NIST, OSTP, UK announce privacy prize challenge	Oct. 19: NSF launches ExLENT program	<section-header></section-header>	Jan. 10: NSF + NobleReach Emerge announce biotechnology investment Jan. 26: NSF announces FuSe program partnerships with Ericsson, Intel, IBM, and Samsung	

## RAMPING UP TIP



	Apr. 3: NSF announces 100 teams advancing to VITAL Prize Challenge Make your innovative education ideas a reality Apr 25: NSF launches new \$9.5M opportunity to support NSF Engines	<section-header><text><text></text></text></section-header>	July 14: NSF announces 54 teams picked for the VITAL Prize Challenge Semi-Final Round Aug. 2: NSF Regional Innovation Engines program selects 16 teams for the final round of competition	<text></text>	Sept. 22: NSF supports the Council of Graduate Schools in efforts to broaden participation in the nation's technology workforce Sept. 26: NSF invests \$26.7M in building the first-ever prototype open knowledge network
APKIL 23	May 5: NSF partners with Sweden for research and innovation May 11: NSF announces the first-ever NSF Engines program awards to 44 unique	June 26: NSF, EDA announce official coordination on regional innovation programs	Sept 13:         New NSF effort expands         L-Corps™ Teams training         program         Image: Corps and the second s	Sept. 21: NSF invests \$25M to advance technologies & communications to operate securely through 5G networksImage: Communication of the secure of	Sept. 27: NSF invests \$18.8M in inaugural cohort of projects enabling experiential learning in key technologies

## RAMPING UP TIP





## Find Your Opportunities



Responsible Design, Development, and Deployment of Technologies

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## LEARN ABOUT TIP

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Resources and upcoming ulletevents

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#### **Technology, Innovation and Partnerships**

A new directorate at the U.S. National Science Foundation

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One year ago, under the leadership of Director Sethuraman Panchanathan, the U.S. National Science Foundation announced the establishment of the Directorate for Technology, Innovation and Partnerships, or TIP, the agency's first new directorate in more than 30 years.

Just a few months later, Congress passed the "CHIPS and Science Act," authorizing the establishment of the directorate and charging it with the critical mission of advancing U.S. competitiveness through investments that accelerate the development of key technologies and address pressing societal and economic challenges.

#### Updates

NSF invests more than \$43 million in NSF Regional Innovation **Engines Development Awards** May 11, 2023

NSF seeks input on novel approaches to emerging technology career pathways



> TIP Programs

Accelerating Research Translation







- America's Seed Fund powered by NSF March 4, 2024
- I-Corps Hubs April 25, 2024
- ReDDDoT April 26, 2024
- PFI September 3, 2024
- POSE September 5, 2024
- ExLENT September 12, 2024
- ART September 18, 2024





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## **Questions?**

- Email tip@nsf.gov
- Visit new.nsf.gov/tip